

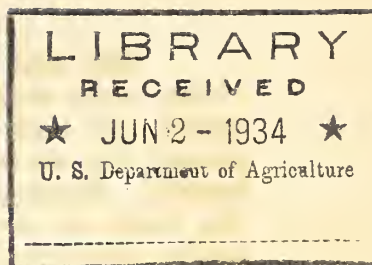
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United States Department of Agriculture  
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U.S. Poultry Experiment Station,  
Glendale, Arizona.



### Brooding Chicks in Tents

The successful brooding of chicks in tents during the fall and winter months, instead of in brooder houses, with the resultant minimum of expense for chick shelters, lower mortality of chicks, and less consumption of electricity, has been demonstrated in a series of tests conducted at the U. S. Poultry Experiment Station at Glendale, Arizona.

The results of previous tests made at this station and by some commercial poultrymen in certain sections of the southwest with the "houseless" method of rearing chicks after they are past the brooder stage, have been gratifying. Now that the brooding of chicks in tents, where mild climatic conditions prevail, has proved entirely satisfactory, this method should be of interest to poultrymen because of its relatively low cost.

Altogether five trials were made in the experiment and in each day-old chicks were divided into two groups of equal numbers, one group being placed in a brooder house and the other in a tent. Rhode Island Red and Barred Plymouth Rock chicks were used in each group in the first test; White Leghorns in the third test; Rhode Island Reds in the second, fourth and fifth tests. The chicks used in the two groups in any one test were from the same parent stock.

All groups were brooded under canopy type, 56-inch diameter, 110-volt, 440-watt electric brooders, of the same make. No additional artificial heat was supplied in either the house or the tent during any of the trials, but roofing paper circles three feet high were placed about two feet from the outer edges of the brooders to help conserve their heat on cool nights.

Similar rations were fed to all groups, except that sour skim-milk was fed during the first part of the fifth trial while semi-solid buttermilk was fed during the first part of the others. General management practices were identical for both groups during each separate trial.

The brooder house used in the tests was 12 feet square at the base, 8 1/2 feet high in front, 6 feet in the rear, and had a wood floor. The lower edge of the opening extending across the front of the house was 2 1/2 feet above the floor and the upper edge of the opening was 1 1/2 feet below the roof. Muslin-covered frames were placed in the opening during cool nights and at other times when it was necessary for the comfort of the chicks.

The tent was 12 feet square at the bottom, 7 1/2 feet high at the ridge, with side walls 33 inches high, and was placed on a wood floor. Boards one inch thick were nailed on edge at the top of the floor around its perimeter, and the bottom of the tent walls fastened to the boards. Openings 10 inches square and approximately one foot below the ridge at the front and at the back of the tent provided the ventilation necessary when the flaps were closed. The tent was securely anchored to prevent it blowing down during any windstorm that might occur. On each side, posts four inches square were placed about four feet out from the middle and corners of the tent and at a slight angle from the vertical. A 2x4 12 feet long was nailed to the posts and the tent ropes were tied to it. The tent poles were also fastened with ropes to posts set in the ground several feet away from the middle of the front and the rear of the tent.

Each group had access to a yard with an area from 240 to 400 square feet for range.

The percentage mortality for each separate trial and the average for all five trials for both the first 42 days and for the entire period of 56 days are given in Table 1. While the data were collected for 56 days in all of the trials, it was necessary to use the brooders for only 42 days or less in some. Regardless of whether 42 days or 56 days is taken as the most suitable period for comparing the average mortality in all five trials, the mortality in the tent groups was slightly lower than the mortality in the house group.

February and March are the months in which most brooding is done in the region in which these tests were conducted. For this reason, the second and fifth trials may be considered the most important for comparing mortality in the differently sheltered groups. The data in Table 1 show that the mortality was less among the chicks brooded in the tent than those brooded in the house during the "normal" brooding months.

In only the fourth trial was the mortality greatest during the 56-day period in the tent group, and the temperature data in Table 2 show that the average minimum temperature was also lowest during that period. This may indicate either that additional heat or that some type of brooder other than electric should be used in a tent during cold weather. However, the next lowest minimum temperature was recorded during the fifth trial, when the mortality was somewhat greater in the house group.

Except as indicated, temperature recordings were made once daily with maximum and minimum thermometers of the type used by the U.S. Weather Bureau, and the most pertinent data are listed in Table 2. It will be noted that the tent was colder than the house at night, as shown by a comparison of the minimum temperatures, and warmer than the house during the daytime, as shown by a comparison of the maximum temperatures. The data also indicate that the five trials were run during considerable ranges of temperature. There were 76° F. difference



between the lowest and the highest temperature recorded in the tent during the second trial, and 83° F. difference between the low temperature of 25° F. recorded in the tent during the fourth trial and the high temperature of 108° F. recorded in the tent during the third trial. Although it is not indicated in the data, differences of 35° F. between the minimum and maximum temperatures recorded in 24 hours are common in the region where these trials were run.

The temperature data indicate why it was necessary to furnish more ventilation in the tent by rolling up the sides during the latter part of the third trial. Additional ventilation in the house was provided by opening the hinged shutters which form a part of its sides and rear.

The difference between the average maximum temperature in the house and the tent appears to be responsible for the difference in the electricity consumption by the two brooders, as shown in Table 3. During three of the trials, and in the average of all five, the brooder in the house used appreciably more electricity than the brooder in the tent. This may be attributed to the fact that the interior of the tent warmed up more rapidly than the interior of the house after the sun appeared in the morning. Thus, the brooder, thermostatically controlled, operated for a smaller number of hours during the daytime in the tent than in the house. Although the tent was colder than the house at night, the roofing paper circle which was used around the brooder in both the tent and the house apparently conserved the heat underneath the brooder to the extent that both brooders consumed approximately the same amount of electricity at night.

The brooder in both the tent and the house used more electricity during the fourth trial than in any of the others, and the consumption was about the same for both brooders. Increase in consumption of electricity is attributable to the weather, for during the fourth trial there were a relatively large number of cool, cloudy days, and the nights were cooler than those during any of the other trials.

Table 1. Mortality

<u>Trial No.</u>	<u>Dates of trial</u>	<u>Kind of shelter</u>	<u>No. chicks started</u>	<u>Mortality 1-42 days</u>	<u>Mortality 1-56 days</u>
1	10-11-31	Tent	304	11.2%	12.2%
	12- 5-31	House	304	12.2	12.2
2	2-12-32	Tent	250	6.4	8.0
	4- 7-32	House	250	8.4	9.6
3	4-13-32	Tent	180	8.3	10.0
	6- 7-32	House	180	7.2	10.0
4	12- 8-32	Tent	225	8.0	11.1
	2- 2-33	House	225	6.7	8.4
5	2-25-33	Tent	234	5.1	5.1
	4-21-33	House	234	6.8	7.7
		Tent	1,193	8.0	9.4
All		House	1,193	8.6	9.7

Table 2. Temperature recordings in degrees Fahrenheit

Trial No.	Kind of shelter	Lowest	Average	Highest	Average	Av. of max. and min. temp.
1.	Tent	27	44.5	101	81.9	63.0
	House	31	48.3	100	79.6	63.8
2*	Tent	27	42.1	103	89.9	62.1
	House	35	46.0	101	86.2	62.9
3	Tent	35	48.5	108	94.9	71.5
	House	38	50.8	106	92.9	71.7
4	Tent	25	34.0	(Not recorded)		--
	House	26	35.0	(Not recorded)		--
5	Tent	32	39.8	97	86.7	62.3
	House	35	42.6	93	82.8	61.9
All	Tent	25	41.8	108	88.4	64.9**
	House	26	44.5	106	85.5	65.2**

\*Maximum temperature taken for last 42 days only.

\*\*Minimum temperature from fourth trial not included.

Table 3. KWH electricity used by brooders.

Shelter	Trial 1	Trial 2	Trial 3	Trial 4	Trial 5	Average
Tent	138	145	86	359	138	173
House	215	268	109	368	137	219

Although the difference was small, the chicks brooded in the tent consumed more feed during the experimental period and weighed more when 56 days old than the chicks brooded in the house.

The average feed consumption was 0.12 pounds greater and the average weight was 0.06 pounds more for the tent chicks than for the house chicks when the data from all trials were averaged.

Inasmuch as one of the principal advantages of tent brooding appears to be the relative cheapness of the tent, a comparison of the cost of the tent and the house should be of interest. The approximate cost of the brooder house, including labor, was \$124. If 10% per year were charged against the house for depreciation and 6% charged as interest on the investment, the yearly cost to the owner would be \$19.84. The tent and poles cost \$19.50 and the wood floor and other lumber used with the tent cost \$4.50. If the tent were allowed to stand during all seasons of the year, it would be suitable for use as a brooder shelter for about three years. If 33-1/3% per year were charged against the tent for depreciation; 10% annual depreciation against the wood floor and other lumber; and 6% charged for interest on the investment, the yearly cost to the owner would be \$8.39. It is probably that the life of the tent would be longer than three years if it were stored in a cool, dry place when it was not needed for brooding purposes..

It is believed that tent brooding can be successfully and advantageously used in the Salt River Valley or in other localities where climatic conditions are similar.

#### Summary

Five tests were made in which similar groups of chicks were brooded under an electric brooder in a tent and in a brooder house. The tent was securely anchored and ventilation was provided.

In accordance with general practice in the region where the tests were made, the electric brooders furnished the only artificial heat used during the brooding period.

The lowest temperature recorded during the tests was 25° F. and the highest was 108° F.

The tent was warmer than the house during the daytime, but colder at night.

If either 42 days or 56 days are considered the brooding period, the average mortality was slightly less in the tent groups.

The brooder in the tent used less electricity than the brooder in the house.

